membrane, were it stretched tightly, would form functionally a drum-head. It is, however, quite loose, and will fluctuate readily on pressure.

The function attributed to this apparatus by F. E. Schulze, that these structures appreciate mass movements of the water, and also waves having longer periods than those appreciated by the ear, is no doubt the correct one. However, the canals cannot act in the manner suggested by Schulze, *i. e.*, by allowing the water to flow freely through them, as such a free communication with the surrounding medium as is implied, is not present. As already stated, in some fishes the canals are completely closed along their entire course, and when openings are present, they are probably for the purpose of maintaining an equilibrium of pressure within and without the apparatus.

The true detailed action of these organs is probably as follows: Let us suppose any disturbing cause to set up a wave of long period in the water. It impinges, first, on the membranous interspaces or drum-heads before spoken of, and with the greatest intensity, of course, on those which are most nearly placed at right angles to its direction. The wave is thus communicated to the liquid in the canals, which transmits it to the adjacent masses of jelly-like mucus covering the disks. The quivering of these little masses probably excites and intensifies vibrations of the hairs of the perceptive cells. The fish probably judges of the direction of the disturbing cause by the portion of the apparatus most intensely excited. The membranous spaces or drum-heads, when the apparatus is well developed, are so arranged as to favor the perception of vibrations from almost all directions.

Dr. Dercum suggested that it would be well, in view of the confusion existing in the present names of the dermal structures of fishes, to call these organs definitely the *lateral sensory apparatus* of fishes. This would, of course, not include the sensory ampullæ of the sharks and rays, nor the Savian vesicles, which have already distinctive names. In view of the structural resemblance of the sensory disks to the maculæ acusticæ, he proposed to call them the *maculæ laterales*, giving a specific signification to the word macula.

May 20.

The President, Dr. Ruschenberger, in the chair.

Thirty persons present.

Note on Mound-making Ants.—Mr. McCook said that he had had an opportunity to spend a day (June 12) on the Allegheny Mountains, above Birmingham, Huntingdon Co., Pa., observing the habits of *Formica exsectöides*, our mountain mound-builder. While standing near a yellow pine tree whose roots ran into a

large double mound, his attention was attracted by a continuous and peculiar rasping sound. This was produced by ants who were scattered over the surface of the trunk engaged in scooping out with their mandibles the bark thereof. The gray outer bark had been removed in many places, and the reddish-brown bark beneath cut away so as to give the tree a marked spotted appearance. The excavated portions covered a surface at times of two or three square inches, and were from one-sixteenth to one-eighth of an inch in depth. The pellets were sometimes allowed to accumulate in the mandibles, but were generally rejected as soon as cut off, and dropped to the earth. In only two cases was there any application of the tongue to the bark. No other tree was observed to be thus marked. The purpose of this curious behavior could not be conjectured.

The directness with which the foragers take the home path was thus illustrated. One worker was seen by his companion, Mr. Kay, to seize a small green insect, with which she immediately turned homeward. She was followed patiently with her burden to the nest, a distance of 126 feet, and her path upon measurement was found to be a direct line. She was twice attacked upon the route, once by several workers of the same species; she hid from these assailants beneath a leaf and waited until they dispersed. The second time she was assaulted by two workers from whom she escaped by running. Once she rested for one half a minute. A number of times she met foragers apparently of her own nest, for after antennal salutations she passed peacefully on. The direct line was in no case interrupted.

In turning up a number of stones in the neighborhood of various mounds, hosts of white ants, *Termes flavipes*, were uncovered, who were instantly attacked by the roving exsectoïdes, and carried off in their jaws. These termites evidently are preyed upon by the mound builders. Nests of small true ants, exposed in a similar way, were similarly dealt with.

A great number of abandoned and moss-grown mounds were seen here. In some cases, one part of the hill was occupied and the other abandoned. In the unoccupied parts when washed out by the rains, the exposed walls of the galleries presented a pretty columnar appearance, which was made more striking by the overcovering moss.

As the evening advanced attention was directed to the gates to note if any attempt would be made to close them. Previous studies, made later in the summer, had failed to detect any such effort. Five doors not far removed from each other upon the side of a large mound, were put under close observation. These were watched until the night was too far advanced to allow further notice, at which time, three doors were quite closed and two nearly so. There appeared to be a conflict of behavior on the part of the workers, some carrying the pellets of earth quite out of the

galleries as usual, while others dropped them near the mouth or door. The evening was quite cool and Mr. McCook's impression was that the ants who dropped the pellets within or just outside of the doors were probably caused to do so by the sense of cold with which they were met. Feeling the cold air as they approached the gate, instead of pushing out, they stopped, dropped the pellet, and turned back. Thus the grains accumulated, giving the appearance of an intentional closing. Through the doors which were nearly closed an ant head and antennæ could occasionally be seen peeping forth.

May 27.

The President, Dr. Ruschenberger, in the chair.

Thirty-four persons present.

Charles H. Pennypacker and Robert S. Davis were elected members.

June 3.

The President, Dr. Ruschenberger, in the chair.

Twenty-one members present.

June 10.

The President, Dr. Ruschenberger, in the chair.

Fifteen persons present.

The deaths of Wm. W. Longstreth and F. F. Maury, M.D., members, were announced.

Combats and Nidification of the Pavement Ant, Tetramorium Cæspitum.—Mr. McCook exhibited a large glass jar containing a nest of this ant made by captives taken from a city garden. During the month of May immense numbers of this species have been seen along our sidewalks, in yards and gardens, engaged in combat. From one of these masses of struggling insects, three large groups were taken and placed in separate jars. The transfer had no visible effect in separating the combatants. Into one jar (No. 1) a pellet saturated in cologne was introduced. Instantly, as in the case of experiments previously reported,[1] the combatants separated, and buried themselves pell-mell in the earth. Not an

[1] Mode of Recognition among Ants, Proceed. Acad. Nat. Sci., p. 15, 1878.